

*Bloomington/Monroe County  
Metropolitan Planning Organization*

# **Crash Report**

**Calendar Years 2009 through 2011**

**September 2012**



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# Executive Summary

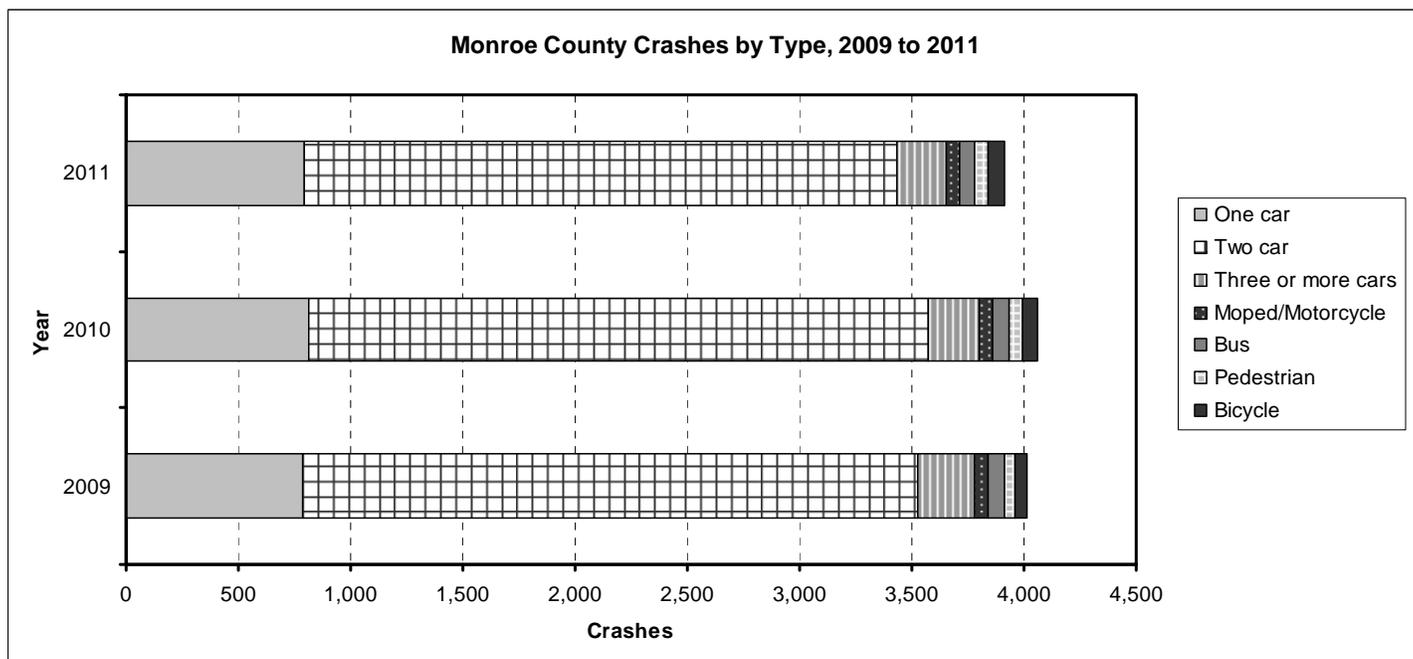
The current version of the Bloomington/Monroe County Metropolitan Planning Organization (MPO) Crash Report continues the MPO's effort to provide a thorough analysis of the causes and trends of crashes in Monroe County. This year's report includes crash data from 2009 to 2011.

This report has been compiled to provide information to the Citizen's Advisory Committee, Technical Advisory Committee, and Policy Committee of the MPO. Additionally, the report will be available to local government agencies, Indiana University, and the general public through the MPO website and the office of the Bloomington Planning Department.

A summary of the crash trends reported within Monroe County is provided below to highlight general information on crash data within Monroe County. In the following sections, detailed tables, charts, and summaries are provided to highlight information on the frequency, severity, and other related characteristics of crashes that occurred from 2009 to 2011. Additionally, the appendix contains information and analysis that may be of interest to some readers.

## Summary of Crash Trends from 2009 to 2011

A total of 11,988 crashes were reported between 2009 and 2011 (Table 1). This figure represents a 3.4% decline from the previous period, 2008 to 2010, as reported in last year's crash report (12,415 crashes from 2008 to 2010). Total crashes for 2011 declined 3.6% compared to 2010. These trends mirror national data, where the total number of crashes declined by 1.6% from 2009 to 2010. Just over three quarters of the total crashes reported in Monroe County involved no injuries (property damage or unknown), and the rest reported various levels of severity in injuries sustained.



A further breakdown of the total 11,988 crashes provides useful insights into trends involving pedestrians, bicyclists, buses, mopeds/motorcycles, and crashes that resulted in fatalities. Over the course of the three years analyzed, there were 29 fatalities (Table 4), somewhat more than the 22 fatalities reported from 2007 to 2009. Of the 31 fatalities, almost half (13) were from single car crashes, six were from two-car crashes, six involved mopeds/motorcycles, and five involved a pedestrian. There were no fatalities involving a bicycle or a bus.

The time distribution of crashes continues to follow a predictable pattern. The greatest number of crashes occurred during weekday rush hours between 4:00 P.M. and 6:00 P.M., with an average slightly greater than 1 crash per hour (Figure 1).

The weekend also follows a predictable pattern in terms of frequency of crashes, but the crash rate has a more even distribution through the day and early evening hours. Between the hours of 7:00 PM and 4:00 PM, the weekend experiences a higher crash frequency than during the week. Friday continued to have the highest number of crashes overall, while Sunday had the lowest number of crashes (Figure 2).

State highways are prominently featured in the list of intersections with the highest crash frequency, or total number of crashes over the time period (Table 2). This could be attributable to several factors, but higher traffic volumes and speeds on these roads are likely factors. The intersection at State Road 37 & W Bloomfield Rd topped the list, followed by State Road 46 & E 3<sup>rd</sup> St then State Road 45/46 Bypass & N College Ave/N Walnut St. Because these intersections continue to exhibit high numbers of crashes from year to year, safety improvements should be considered. Locations that show a high number of crashes, but do not involve state managed highways, should also be considered for safety improvements through the MPO's Highway Safety Improvement Program (Table A1).

The leading cause of crashes during the study period was once again failure to yield right of way with 2,455 incidents (Table 3). Other leading causes include following too closely, reaction to other driver behaviors, and unsafe backing. These causes can be addressed through law enforcement and education efforts as well as through physical improvements. Running off the right side of the road and speeding in adverse weather present opportunities for physical safety improvements, such as guard rails, rumble strips, and interactive signage. These types of improvements should be explored further to reduce crashes.

Bicycle and pedestrian crashes are an important consideration due to a relatively high number of non-motorized trips in the area, and the sensitivity to injury of individuals using these modes. It is well understood that when compared to other types of crashes, those involving bicyclists and pedestrians are much more likely to result in a fatality or incapacitating injury. Therefore, reducing the frequency of these crashes is a priority. The intersection of E 7<sup>th</sup> St & Jordan Ave had the highest number of bicycle crashes, while the intersection of N Dunn St & E Kirkwood Ave topped the list for pedestrian crashes in the third consecutive crash report, both locations warranting further investigation.

# Introduction

Mobility continues to be a defining aspect of life in the United States and around the world. Investment in transportation infrastructure has led to new opportunities for trade, travel, recreation, relocation, and economic growth. The BMCMPO receives approximately \$3.1 million per year of federal transportation funding allocated from the Indiana Department of Transportation to invest in our local transportation network. Despite this continued investment, the effectiveness of our transportation system is undermined by human, economic, and financial costs attributable to motor vehicle crashes.

Motor vehicle crashes are a significant cause of death, injury, property loss and productivity loss in the United States. Data for 2009 shows that unintentional accidents were the 5<sup>th</sup> leading cause of death overall, and of the 118,021 total unintentional accidents reported, 39,031 (33%) are attributed to transportation.<sup>1</sup> While it may not be possible to completely eliminate motor vehicle crashes, gaining a better understanding of their causes can help transportation planners and engineers reduce their frequency and severity. This report attempts to characterize the motor vehicle crashes in Monroe County, Indiana, providing the basis for informed transportation policies and infrastructure investments.

The annual Crash Reports demonstrate that motor vehicle crashes contribute to a significant loss of life, property, and productivity in Monroe County. Through continued efforts in crash reporting and analysis, a better understanding of crash trends will be attained. From this information, targeted infrastructure investments should further improve safety on roads within the county. Therefore, the purpose of this report is twofold. First, the report provides a consistent and straightforward means to disseminate annual crash data which can be utilized by any interested individual or organization. Second, the report provides another tool for civil engineers, transportation planners, and local policy makers to use when considering mitigation strategies aimed to reduce the frequency and severity of transportation related crashes. Specifically, the Indiana Department of Transportation and the BMCMPO require Local Public Agencies (LPAs) to use crash data as part of the Highway Safety Improvement Program (HSIP). This program provides federal funding to target areas with high incidences of crashes. It is the overall goal of HSIP to reduce the number of fatal and incapacitating injury crashes. Through annual reporting and analysis, effective mitigation strategies can be implemented to further curtail crashes within Monroe County.

This report focuses on a three year period from 2009 to 2011. By focusing on a longer time horizon, random variations in annual crashes do not unduly influence the trends reported. For instance, annual variations in bicycle and pedestrian crashes, fatalities and incapacitating injuries, and location-specific crashes can be significant, even though there may not be an actual change in the likelihood of those crashes. By using a three-year window, identified trends are more likely to be meaningful. However, results from 2011 alone are often highlighted to provide a snapshot of the most recent year.

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<sup>1</sup> Centers for Disease Control, National Center for Health Statistics. National Vital Statistics Reports – Deaths: Final Data for 2009. Volume 59, Number 10. [http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60\\_03.pdf](http://www.cdc.gov/nchs/data/nvsr/nvsr60/nvsr60_03.pdf). Accessed on August 14, 2012.

# **Methodology and Data Considerations**

The data for the Bloomington/Monroe County Crash Report originates from the “Automated Report and Information Exchange System” (ARIES) of the Indiana State Police. This system contains crash data from police reports since 2003. The police report data is organized by collisions, units (vehicles), and individuals. These entities are related to one another by a field in each table (Master Record Number), but can also be analyzed independently. It is possible to retrieve information regarding collisions (e.g., where and when did the greatest number of crashes occur?), vehicles involved (e.g., how many crashes involved bicycles?), and individuals involved (e.g., how old were the crash victims?). It is also possible to perform more complex analyses using attributes from each of these entities (e.g., which location had the most elderly crash victims?).

As with any database, the validity of conclusions resulting from the data is contingent upon accurate and complete data entry. Lack of information from hit-and-run collisions, confusion surrounding alternate names of roads (e.g., Country Club Drive, Winslow Road), misspelled or mis-entered street names, GPS errors, and incomplete data entry undoubtedly introduce some error into the results of this report. Therefore, results should not be interpreted rigidly.

A significant effort was made to correct data errors and validate results. It is important to note that the methodology was improved for this report. Consequently, some minor inconsistencies may be evident when comparing crash reports from different years. Therefore, it should be understood that the most recently issued crash report reflects the best and most accurate crash information. Regardless of methodological changes and slight differences between reports, the overall findings of this report are consistent with those of past years.

Collisions were categorized for analysis based on the type and severity of the crash. If the crash included a moped, motorcycle, bus, bicyclist or pedestrian, it was classified as a “moped/motorcycle”, “bus”, “bicycle” or “pedestrian” crash, accordingly, regardless of the number of vehicles involved. If the crash involved only motor vehicles, the “crash type” classification was based on the number of cars: one car, two cars, or three or more cars. The “severity” classification of a collision was based on the most severe injury that resulted from the crash. For example, if a crash resulted in a fatality as well as a non-incapacitating injury, the severity of the crash was classified as “Fatal Injury.” Most data methods used in the report are self-explanatory.

Collisions were analyzed using available geographic, road inventory, and traffic count data. Individual crashes were located based on the reported geographic coordinates, which were available for more than 92% of all records. A crash frequency was determined for each intersection by tabulating the total number of crashes that occurred within a 250-ft radius of the center of the intersection. Crash rates were determined from available traffic counts conducted by the City of Bloomington, Monroe County, and the Indiana Department of Transportation, utilizing standard adjustments and engineering judgment as necessary.

When reading the report, it is important to understand the distinction between “crashes” and “individuals.” The term “crash” is used when the characteristics of the crash itself are under consideration, whereas the terms “individual” and “fatality” are used when the focal point is the people involved. For example, the “Fatal Injury” column of Table 1 (“Crash by Type and Severity, 2009-2011”) shows how many crashes resulted in a fatal injury in 2010, but it would be incorrect to interpret this column as the number of fatalities in 2010, since more than one fatality can result from a single crash.

# Analysis

## Crash Characteristics

This section provides a summary of crash characteristics in Monroe County, including the type and severity of crashes from 2009-2011. These factors reflect trends in the overall safety of the transportation system.

In 2011, a total of 3,914 motor vehicle crashes were reported in Monroe County (Table 1). Of these, nine resulted in one or more fatalities, while sixty-two caused incapacitating injuries. For the vast majority of crashes (3,074), injuries were not reported. Two-car crashes were the most common, comprising 68% of the total. One-car crashes and those involving three or more cars were also common, accounting for 20% and 6% of total crashes reported, respectively. Crashes involving a pedestrian, cyclist, moped/motorcycle, or bus were much less frequent. However, with the exception of crashes involving a bus, these were much more likely to involve injury than vehicle crashes.

Compared with 2009 and 2010, the overall number of crashes in 2011 decreased slightly.

**Table 1. Crashes by Type and Severity, 2009-2011**

	Crash Type	Severity				Annual Total	Percent of Annual Total
		Fatal Injury	Incapacitating Injury	Non-incapacitating	No injury/unknown		
2009	One car	3	9	157	620	789	19.7%
	Two car	0	13	453	2273	2739	68.2%
	Three or more cars	1	4	94	151	250	6.2%
	Bus	0	1	5	57	63	1.6%
	Moped/Motorcycle	2	10	54	19	85	2.1%
	Bicycle	0	1	30	6	37	0.9%
	Pedestrian	1	6	41	3	51	1.3%
	<b>Total</b>	<b>7</b>	<b>44</b>	<b>834</b>	<b>3129</b>	<b>4014</b>	<b>100.0%</b>
	<b>Percent of Annual Total</b>	<b>0.2%</b>	<b>1.1%</b>	<b>20.8%</b>	<b>78.0%</b>	<b>100.0%</b>	
2010	One car	6	8	160	642	816	20.1%
	Two car	5	25	465	2265	2760	68.0%
	Three or more cars	0	3	93	125	221	5.4%
	Bus	0	0	5	57	62	1.5%
	Moped/Motorcycle	1	12	56	17	86	2.1%
	Bicycle	0	3	40	8	51	1.3%
	Pedestrian	1	10	46	7	64	1.6%
	<b>Total</b>	<b>13</b>	<b>61</b>	<b>865</b>	<b>3121</b>	<b>4060</b>	<b>100.0%</b>
	<b>Percent of Annual Total</b>	<b>0.3%</b>	<b>1.5%</b>	<b>21.3%</b>	<b>76.9%</b>	<b>100.0%</b>	
2011	One car	3	13	123	652	791	20.2%
	Two car	3	17	428	2194	2642	67.5%
	Three or more cars	0	6	71	146	223	5.7%
	Bus	0	0	2	55	57	1.5%
	Moped/Motorcycle	3	13	48	19	83	2.1%
	Bicycle	0	3	34	4	41	1.0%
	Pedestrian	0	10	63	4	77	2.0%
	<b>Total</b>	<b>9</b>	<b>62</b>	<b>769</b>	<b>3074</b>	<b>3914</b>	<b>100.0%</b>
	<b>Percent of Annual Total</b>	<b>0.2%</b>	<b>1.6%</b>	<b>19.6%</b>	<b>78.5%</b>	<b>100.0%</b>	
3-Year	<b>Total</b>	<b>29</b>	<b>167</b>	<b>2468</b>	<b>9324</b>	<b>11988</b>	
	<b>Percent of 3-Year Total</b>	<b>0.2%</b>	<b>1.4%</b>	<b>20.6%</b>	<b>77.8%</b>	<b>100.0%</b>	

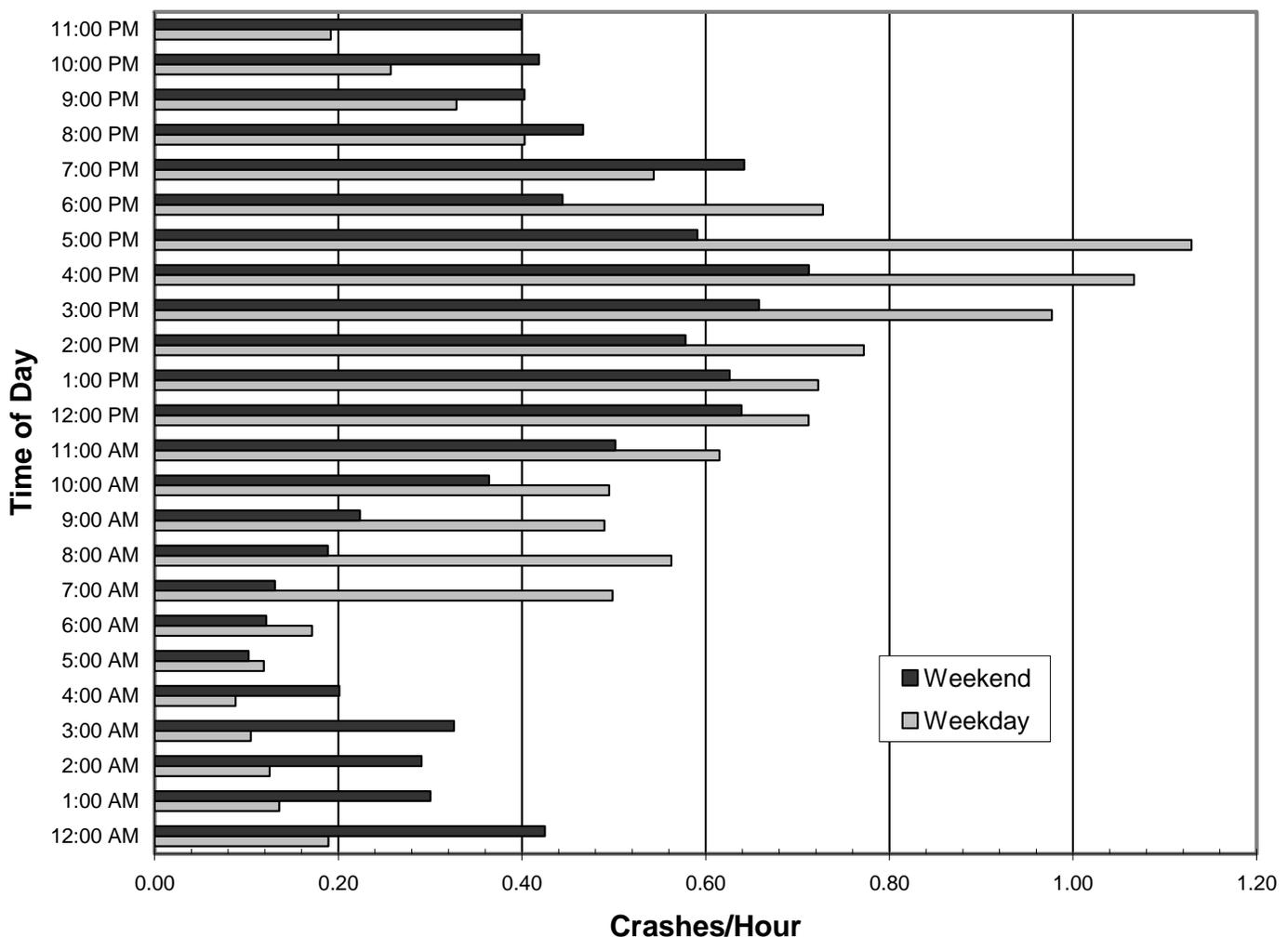
## Time of Crashes

This section summarizes the number of crashes by hour and day. Information relating to the timing of crashes can be used by law enforcement agencies and emergency responders for planning purposes. Additionally, decision makers may use this information in an attempt to reduce peak crash times.

On weekdays, the number of crashes typically peaked in conjunction with the morning rush hour, 7:00 AM to 9:00 AM, and then increased gradually throughout the day until peaking again in conjunction with the evening rush hour, 5:00 PM to 7:00 PM. The late afternoon was the most likely time for a crash to occur, with more than one per hour.

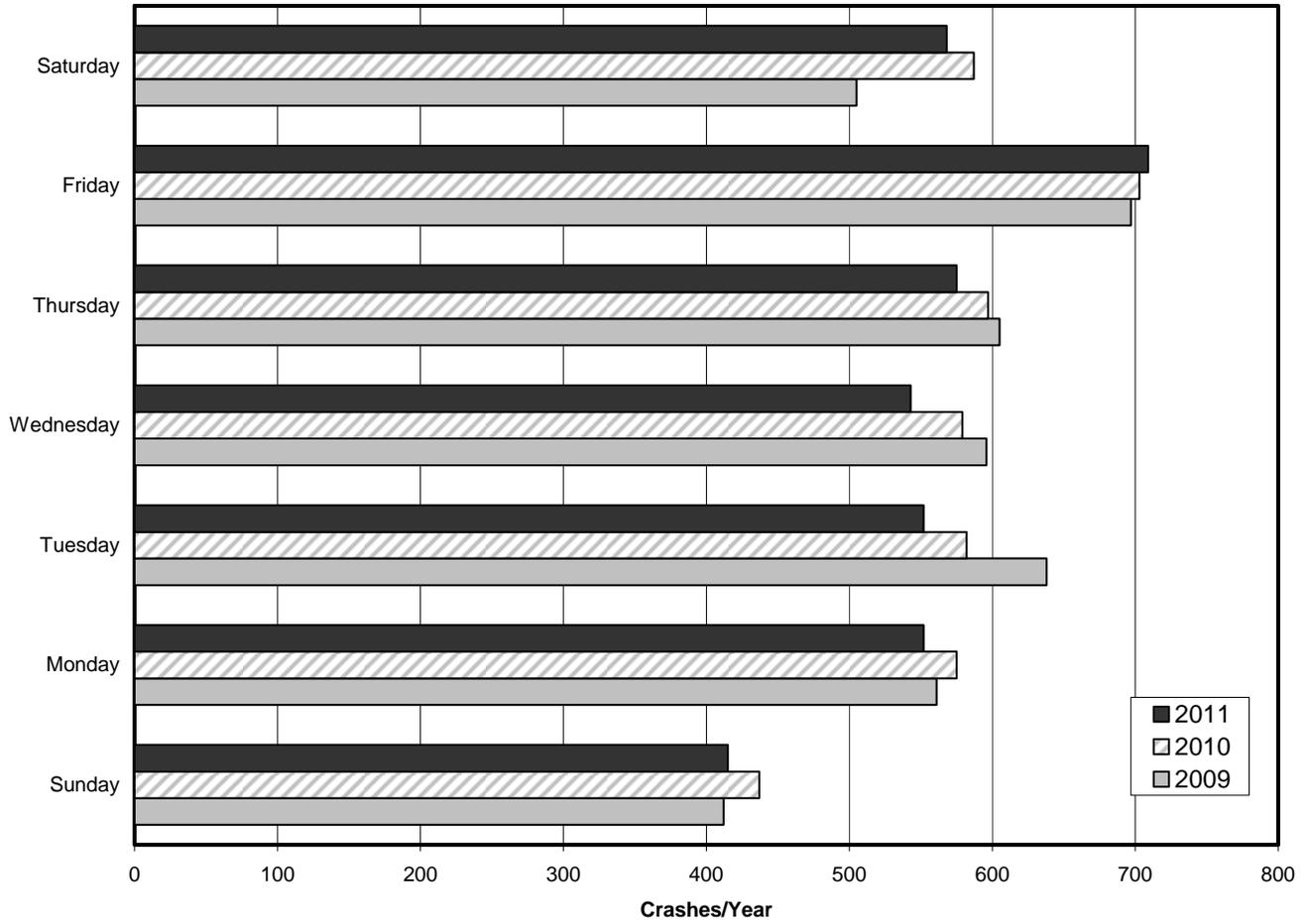
The hourly distribution of crashes for the weekend was less varied than for the work week. Crashes in the late evening and early morning were much more common during the weekend, and rush hour peaks were not as prevalent as on weekdays. During the study period, a greater number of crashes occurred on Fridays than on any other day and the fewest crashes occurred on Sundays (Figure 2).

**Figure 1. Crashes by Time of Day, 2009-2011**<sup>2</sup>



<sup>2</sup> Hours shown represent the beginning of the hour. For example, "12:00 AM" represents the time period from 12:00 AM to 12:59 AM.

**Figure 2. Crashes by Day of Week, 2009-2011**



## Crash Locations

This section addresses the spatial distribution of crashes in Monroe County in order to highlight problematic intersections. Two methods are used. First, all of the intersections in Monroe County are ordered based on crash frequency, or the total number of crashes that occurred at each location over the 3-year period. The top 50 intersections in Monroe County with the highest crash frequency are listed in Table 2. Second, the highest frequency crash locations are ranked based on crash rate, or the total number of crashes divided by the total number of entering vehicles over the time period (Table 3). Analyzing crash frequency and crash rates can help transportation planners, engineers, and officials to identify locations that may have hazardous geometric or operational deficiencies.

In 2011, the intersection with greatest crash frequency was State Road 37 & W Bloomfield Rd, where 36 crashes were reported (Table 2). This intersection also had the greatest number of total crashes during the period from 2009 to 2011, with 108 reported crashes. The highest frequency crash locations have remained consistent over time, with 83% of the locations in Table 2 having appeared in the previous year's analysis, covering the period 2008 to 2010.

However, locations with a high crash frequency are not necessarily more hazardous than locations with a lower crash frequency. To account for the effect of traffic volume on the total number of crashes at a particular location, a normalized crash rate was calculated for each of the intersections in Table 2 (Table 3)<sup>3</sup>. Available traffic counts were used to estimate the number of vehicles entering the intersection over the time period, utilizing standard adjustment factors and engineering judgment as necessary<sup>4,5</sup>. During the period from 2009 to 2011, the intersection with the greatest crash rate was State Road 46 & S Pete Ellis Dr, followed by E 13th St & N Indiana Ave.

The methodology used in this report does not help identify intersections that have high crash rates but relatively few crashes overall, nor does it help to identify intersections that tend to have more severe crashes. Therefore, future reports should consider new additional analyses such as a comparison of intersections based on crash severity, and a comparison of crash rates among intersections with similar operating characteristics. These additional analyses will further aid transportation planners, engineers, and officials in effectively identifying hazardous locations, and securing funding to fix them.

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<sup>3</sup> Crash Rate =  $N / ((\text{Intersection\_AADT}) * 3 \text{ years} * 365 \text{ days} * 10^{-6})$ ,  
where N = total number of crashes from 2009 to 2011, and  
where Intersection\_AADT = sum of average annual daily traffic entering the intersection

<sup>4</sup> Indiana Department of Transportation. 2011 Traffic Adjustment Factors.  
[http://www.in.gov/indot/files/TrafficStatistics\\_AdjustmentFactors\\_05112011.pdf](http://www.in.gov/indot/files/TrafficStatistics_AdjustmentFactors_05112011.pdf). Accessed on August 10, 2012.

<sup>5</sup> Traffic counts were available for 97% of all intersection approaches. In six instances, standard estimates based on roadway classification were used. Traffic counts adjustment factors were applied for seasonal, yearly, and weekday variation, as applicable.

**Table 2. Top 50 Crash Locations by Crash Frequency, 2009-2011**

Crash Frequency Rank	Previous Rank	Intersection	Jurisdiction	Year			3-Year Total
				2009	2010	2011	
1	2	State Road 37 & W Bloomfield Rd	IN	30	42	36	108
2	5	State Road 46 & E 3rd St	IN	36	33	35	104
3	1	State Road 45/46 Bypass & N College Ave/N Walnut St	IN	41	29	29	99
4	3	State Road 37 & State Road 48/W 3rd St	IN	37	28	32	97
5	4	State Road 46 & S Pete Ellis Dr	IN	26	47	21	94
6	7	State Road 45 & S Curry Pike/S Leonard Springs Rd	IN	31	27	25	83
7	9	State Road 45/46 Bypass & E 10th St	IN	22	30	27	79
8	6	State Road 37 & W Vernal Pike	IN	33	24	20	77
9	8	State Road 45 & S Liberty Dr	IN	23	36	15	74
10	10	State Road 48 & S Liberty Dr	IN	25	24	21	70
11	11	State Rd 48 & S Gates Dr	IN	22	21	20	63
12	12	State Rd 46 & S Kingston Dr	IN	24	19	18	61
13	13	State Road 45/46 Bypass & N Kinser Pike	IN	19	19	21	59
14	36	W 3rd St & S Cory Ln	COB	9	23	24	56
15	15	W 10th St & N College Ave	COB	15	22	17	54
15	14	E 10th St & N Fee Ln	COB	15	24	15	54
17	20	E 3rd St & S Washington St	COB	24	17	12	53
18	54	State Road 45 & S Gillham Dr	IN	16	11	24	51
18	22	E 3rd St & S Jordan Ave	COB	11	18	22	51
18	18	State Road 46 & S Smith Rd	IN	20	14	17	51
21	17	W 2nd St & S College Ave	COB	23	15	12	50
22	26	W 3rd St & S College Ave	COB	12	18	17	47
23	50	E 17th St & N Jordan Ave	COB	6	14	26	46
24	23	State Road 37 & W Tapp Rd	IN	11	23	11	45
24	18	W 7th St & N Walnut St	COB	15	18	12	45
26	47	E 10th St & N Union St	COB	10	13	21	44
26	23	State Road 45 & N Pete Ellis Dr/N Range Rd	IN	21	12	11	44
28	16	E 10th St & N Jordan Ave	COB	16	17	10	43
28	32	W 17th St & N Kinser Pike/N Madison St	COB	14	14	15	43
30	23	W 3rd St & N Walnut St	COB	19	11	10	40
31	20	S Walnut Street Pike & E Winslow Rd	COB	16	12	10	38
31	28	W Kirkwood Ave & N Walnut St	COB	14	12	12	38
31	36	E 10th St & N Sunrise Dr	COB	13	14	11	38
31	28	State Road 46 & E Eastgate Ln	IN	14	17	7	38
31	64	E 17th St & N Dunn St	COB	12	8	18	38
36	43	E 3rd St & S Woodlawn Ave	COB	7	13	16	36
36	50	State Road 46 & S Park Ridge Rd	IN	13	12	11	36
36	33	E 17th St & N Fess Ave	COB	17	10	9	36
39	43	E 3rd St & S Fess Ave	COB	10	13	12	35
39	35	W 7th St & N College Ave	COB	14	14	7	35
41	36	E Rhorer Rd & S Walnut Street Pike	MC	9	13	12	34
41	70	State Road 45/46 Bypass & E 17th St	IN	10	11	13	34
41	41	State Road 45/46 Bypass & N Dunn St	IN	13	12	9	34
44	29	W 2nd St & S Rogers St	COB	10	17	6	33
44	70	E 10th St & N Jefferson St	COB	11	10	12	33
44	64	E 10th St & N Woodlawn Ave	COB	9	13	11	33
47	58	State Road 46 & N Centennial Dr	IN	8	14	10	32
47	45	W 4th St & S Walnut St	COB	6	14	12	32
47	40	E 13th St & N Indiana Ave	COB	10	11	11	32
50	28	W Grimes Ln & S Walnut St	COB	12	13	6	31
50	76	E 3rd St & S Jefferson St	COB	11	10	10	31
50	58	W 2nd St & S Patterson Dr	COB	11	15	5	31

**Table 3. Top 50 Crash Locations by Crash Rate, 2009-2011**

<b>Crash Rate Rank</b>	<b>Crash Frequency Rank</b>	<b>Intersection</b>	<b>Jurisdiction</b>	<b>3-Year Total</b>	<b>Crashes per Million Entering Vehicles</b>
1	5	State Road 46 & S Pete Ellis Dr	IN	94	1.83
2	47	E 13th St & N Indiana Ave	COB	32	1.72
3	31	E 10th St & N Sunrise Dr	COB	38	1.46
4	12	State Rd 46 & S Kingston Dr	IN	61	1.44
5	15	E 10th St & N Fee Ln	COB	54	1.39
6	2	State Road 46 & E 3rd St	IN	104	1.37
7	15	W 10th St & N College Ave	COB	54	1.33
8	36	State Road 46 & S Park Ridge Rd	IN	36	1.31
8	18	State Road 45 & S Gillham Dr	IN	51	1.31
10	17	E 3rd St & S Washington St	COB	53	1.28
10	36	E 17th St & N Fess Ave	COB	36	1.28
12	44	E 10th St & N Jefferson St	COB	33	1.26
13	14	W 3rd St & S Cory Ln	COB	56	1.22
14	26	State Road 45 & N Pete Ellis Dr/N Range Rd	IN	44	1.20
14	26	E 10th St & N Union St	COB	44	1.20
16	6	State Road 45 & S Curry Pk/S Leonard Springs Rd	IN	83	1.18
17	36	E 3rd St & S Woodlawn Ave	COB	36	1.16
18	39	E 3rd St & S Fess Ave	COB	35	1.14
19	31	S Walnut Street Pk & E Winslow Rd	COB	38	1.13
19	41	E Rhorer Rd & S Walnut Street Pk	MC	34	1.13
19	3	State Road 45/46 Bypass & N College Ave/N Walnut St	IN	99	1.13
19	31	State Road 46 & E Eastgate Ln	IN	38	1.13
19	7	State Road 45/46 Bypass & E 10th St	IN	79	1.13
24	10	State Road 48 & S Liberty Dr	IN	70	1.12
25	9	State Road 45 & S Liberty Dr	IN	74	1.10
26	24	W 7th St & N Walnut St	COB	45	1.06
27	18	State Road 46 St & S Smith Rd	IN	51	1.05
28	31	E 17th St & N Dunn St	COB	38	1.02
29	44	E 10th St & N Woodlawn Ave	COB	33	1.01
30	23	E 17th St & N Jordan Ave	COB	46	1.00
31	21	W 2nd St & S College Ave	COB	50	0.99
31	11	W 3rd St & S Gates Dr	IN	63	0.99
33	18	E 3rd St & S Jordan Ave	COB	51	0.97
34	28	W 17th St & N Kinser Pk/N Madison St	COB	43	0.96
34	22	W 3rd St & S College Ave	COB	47	0.96
36	28	E 10th St & N Jordan Ave	COB	43	0.92
37	8	State Road 37 & W Vernal Pk	IN	77	0.91
38	1	State Road 37 & W Bloomfield Rd	IN	108	0.89
39	39	W 7th St & N College Ave	COB	35	0.87
40	31	W Kirkwood Ave & N Walnut St	COB	38	0.83
40	13	State Road 45/46 Bypass & N Kinser Pk	IN	59	0.83
42	47	W 4th St & S Walnut St	COB	32	0.78
43	4	W 3rd St & State Road 37	IN	97	0.75
44	44	W 2nd St & S Rogers St	COB	33	0.66
45	50	E 3rd St & S Jefferson St	COB	31	0.64
46	30	W 3rd St & N Walnut St	COB	40	0.61
47	41	State Road 45/46 Bypass & E 17th St	IN	34	0.60
48	41	State Road 45/46 Bypass & N Dunn St	IN	34	0.58
49	50	W 2nd St & S Patterson Dr	COB	31	0.53
50	24	State Road 37 & W Tapp Rd	IN	45	0.52
51	47	State Road 46 & N Centennial Dr	IN	32	0.51
52	50	E Grimes Ln & W Grimes Ln & S Walnut St	COB	31	0.43

## Crash Factors

This section summarizes the primary crash factors from 2009 to 2011. An understanding of these causes informs infrastructure investments, enforcement activities, and educational efforts. For instance, unsafe speeds can be addressed by traffic enforcement and road design, while the tendency of motorists to drive off the road can be mitigated with a guardrail or rumble strips. Similarly, enforcement and education could reduce the number of crashes attributable to alcohol.

Failure to yield right of way was once again the most common cause of crashes, contributing to over 2,500 crashes from 2009 to 2011. Following too closely, driver errors, and unsafe backing were also significant crash factors. Table 3 shows the top 10 primary crash factors for 2009-2011, which account for over three-quarters of total crashes.

**Table 4. Top 10 Primary Crash Factors by Severity, 2009-2011**

Rank	Primary Factor	Severity				3-Year Total
		Fatal Injury	Incapacitating Injury	Non-Incapacitating Injury	No Injury/Unknown	
1	Failure to yield right of way	3	36	637	1,779	<b>2,455</b>
2	Following too closely	0	13	417	1,262	<b>1,692</b>
3	Other driver errors	2	15	199	1,049	<b>1,265</b>
4	Unsafe backing	0	3	33	1,167	<b>1,203</b>
5	Ran off road right	5	14	174	508	<b>701</b>
6	Speed too fast for weather conditions	0	4	120	404	<b>528</b>
7	Driver distracted	0	3	119	322	<b>444</b>
8	Animal/object in roadway	1	8	46	388	<b>443</b>
9	Disregard signal/reg sign	0	11	159	263	<b>433</b>
10	Improper turning	0	3	31	350	<b>384</b>

## Fatalities

This section provides a focused look at motor vehicle fatalities in Monroe County from 2009 to 2011. As with previous sections, the material presented here can be useful for enforcement, education, and decision-making.

In 2011, there were nine fatalities in Monroe County (Table 5). Of these, three resulted from single-car crashes, three from two-car crashes, three from crashes involving a moped or motorcycle. Over the period from 2009 to 2011, the average annual number of fatalities per 100,000 residents was 7.3 for Monroe County. This figure is below the U.S. average of 10.63 fatalities per 100,000 people for 2010<sup>6</sup>.

**Table 5. Fatalities by Crash Type, 2009-2011**

Year	Crash Type						Total	Fatalities per 100,000 Population
	One car	Two cars	Three cars or more	Moped and Motorcycle	Bicycle	Pedestrian		
2009	3	0	1	2	0	1	7	5.4
2010	6	5	0	1	0	1	13	9.9
2011	3	3	0	3	0	0	9	6.5
<b>Total</b>	<b>12</b>	<b>8</b>	<b>1</b>	<b>6</b>	<b>0</b>	<b>2</b>	<b>29</b>	<b>7.3</b>

<sup>6</sup> U.S. Department of Transportation, National Center for Statistics & Analysis. Fatality Analysis Reporting System, Web-Based Encyclopedia. <http://www-fars.nhtsa.dot.gov/> Accessed on July 27, 2012.

## Fatal Crash Locations

This section summarizes the locations for crashes that resulted in fatalities. From 2009 to 2011, there were 29 fatal crashes, which resulted in 29 fatalities. The locations of these fatal crashes are identified in Table 6. Location information will aid transportation planners and engineers to identify problematic locations. Fatalities are a major factor in determining HSIP funding eligibility (see the Table A1 in the appendix for more information).

**Table 6. Fatal Crash Locations by Type, 2009-2011**

Location	Jurisdiction	Total	Crash Type				
			One Car	Two Cars	Three or More Cars	Moped or Motorcycle	Pedestrian
State Road 37 @ W Wayport Rd	IN	2	0	2	0	0	0
E 13th St @ N Fee Ln	COB	1	0	0	0	0	1
E Monroe Dam Rd From S Strain Ridge Rd To S Foggy Morning Rd	MC	1	1	0	0	0	0
E North Dr @ S Walnut St	COB	1	0	1	0	0	0
N Dunn St @ N Old State Road 37	COB	1	0	0	0	1	0
N Old State Road 37 From W Gourley Pk To W Club House Dr	COB	1	0	0	0	1	0
N Thomas Rd from W Vernal Pike to W Ratliff Rd	MC	1	1	0	0	0	0
S Fairfax Rd @ E Schacht Rd	MC	1	0	1	0	0	0
S Leonard Springs Rd @ W Stapleton Ave	MC	1	0	1	0	0	0
State Road 37 & W Sample Rd	IN	1	0	1	0	0	0
State Road 37 From E Ellis Rd To E Wylie Rd	IN	1	1	0	0	0	0
State Road 37 From E Zikes Rd To E Smithville Rd	IN	1	0	0	0	1	0
State Road 37 From W Simpson Chapel Rd To S Lee Paul Rd	IN	1	1	0	0	0	0
State Road 446 @ E Chandler Rd	IN	1	0	0	0	1	0
State Road 446 From E Kent Rd To N Brummetts Creek Rd	IN	1	0	1	0	0	0
State Road 446 From Moores Pk To Old State Road 446	IN	1	1	0	0	0	0
State Road 446 From S Chapel Hill Rd To E Allens Creek Rd	IN	1	1	0	0	0	0
State Road 45 & W Sparks Rd	IN	1	1	0	0	0	0
State Road 46 @ E Kings Rd	IN	1	1	0	0	0	0
State Road 46 From W Flatwoods Rd To N Red Hill Rd	IN	1	0	0	1	0	0
State Route 446 From S Old Richardson Rd To E Merritt Drive	IN	1	0	1	0	0	0
W 3rd St @ S Patterson Dr	COB	1	0	0	0	1	0
W Airport Rd From S Cave Rd To S Kirby Dr	MC	1	1	0	0	0	0
W Arlington Rd @ N Canterbury Ct	MC	1	1	0	0	0	0
W Beasley Dr @ S Curry Pike	MC	1	1	0	0	0	0
W Cockrell Rd From S Rockport Rd To S Sweetwater Ln	MC	1	0	0	0	0	1
W Eller Rd @ S Garrison Chapel Rd	MC	1	0	0	0	1	0
W Howard Rd @ N Starnes Rd	MC	1	1	0	0	0	0

## Bicycle and Pedestrian Crashes

This section reports on the number of bicycle and pedestrian crashes in Monroe County from 2009 to 2011. Such crashes are an important consideration in Bloomington and Monroe County due to a relatively high number of non-motorized trips in the area. For instance, data from the 2010 American Community Survey indicates that 2.7% of commuters in Bloomington use a bicycle as their primary mode of transportation, while 10.7% walk<sup>7</sup>. By comparison, 0.6% of US commuters reported bicycling and 2.9% reported walking as their primary modes in 2010<sup>8</sup>. Individuals using these modes of transportation are particularly vulnerable to injury.

In 2011, there were 41 reported crashes involving a cyclist and 77 involving a pedestrian (Table 1). This included ten pedestrian and three bicycle crashes that resulted in incapacitating injuries. During the period from 2009 to 2011, 321 pedestrian and bicycle crashes were reported, resulting in two pedestrian fatalities. It is well understood that crashes involving these modes of transportation more often result in injury when compared with other crash types, therefore there is a need to reduce the frequency and severity of these crashes.

**Table 7. Top Bicycle and Pedestrian Crash Locations, 2009-2011**

Current Rank	Previous Rank	Intersection	Jurisdiction	Crash Type		Total
				Bicycle	Pedestrian	
1	-	E 7th St & N Jordan Ave	COB	5	1	6
2	1	N Dunn St & E Kirkwood Ave	COB	0	5	5
2	2	E 10th St & N Jordan Ave	COB	2	3	5
2	5	E 10th St & N Fee Ln	COB	3	2	5
2	5	N Fee Ln & E Law Ln	COB	2	3	5
7	5	W 7th St & N College Ave	COB	0	4	4
7	2	W 7th St & N Walnut St	COB	1	3	4
9	-	State Road 45 & S Curry Pk	IN	0	3	3
9	-	E Miller Dr & S Walnut St	COB	1	2	3
9	5	S College Mall Rd & Eastland Plaza	COB	2	1	3
9	5	E 3rd St & S Woodscrest Dr	COB	2	1	3
9	5	State Road 46 & S Kingston Dr	IN	0	3	3
9	-	N Grant St & E Kirkwood Ave	COB	1	2	3
9	-	E 10th St & N Union St	COB	2	1	3
9	-	E 13th St & N Indiana Ave	COB	3	0	3

<sup>7</sup> US Census Bureau. 2010 American Community Survey, 1-Year Estimate. <http://www.census.gov/acs/> Accessed on July 27, 2012.

<sup>8</sup> Ibid.

## Conclusion

This report has demonstrated a number of meaningful trends relating to motor vehicle crashes in Monroe County. The information should inform transportation decision-making and, ultimately, lead to a safer, more efficient transportation system.

Some problem areas noted in this and past reports have already been improved or are in the process of being addressed. For example, in 2009, the City of Bloomington completed improvements to the intersection of E 17<sup>th</sup> Street and N Fee Ln, and Monroe County finished improvements to the dangerous curve at E Rogers Rd and S Smith Rd. Post-construction data from this report shows a 37% reduction in the crash frequency at the intersection of 17<sup>th</sup> Street and Fee Lane following the completion of these improvements<sup>9</sup>. In future years, we will be able to analyze the impact of improvements at the E Atwater Ave and S Henderson St intersection which were completed in 2011. Evaluation of past and future crash data at these, and other, locations will further aid in implementing appropriate and effective mitigation strategies to reduce crashes.

There are many additional locations that will require further study to see if physical improvements could be implemented to improve safety. Several intersections along State Roads (37, 45, 46, Bypass) continue to be problematic due to the sheer frequency of crashes. Due to jurisdictional boundaries at these locations, state and local officials, engineers, and staff will need to coordinate targeted safety improvements and reach agreements before any improvements can occur.

Data and analysis on other attributes are included within the report (e.g. bus, moped, motorcycle, fatalities, causes, locations, severity of crashes), providing additional information to identify trends and/or areas of concern. Future versions of this report may consider a more detailed analysis of the circumstances of fatal and incapacitating crashes and the characteristics of individuals involved. In particular, age-related factors and impacts could be explored. An improved understanding of these factors would help the community to better focus its efforts on reducing serious traffic injuries and their impact on our community, which is one of the primary purposes of this report.

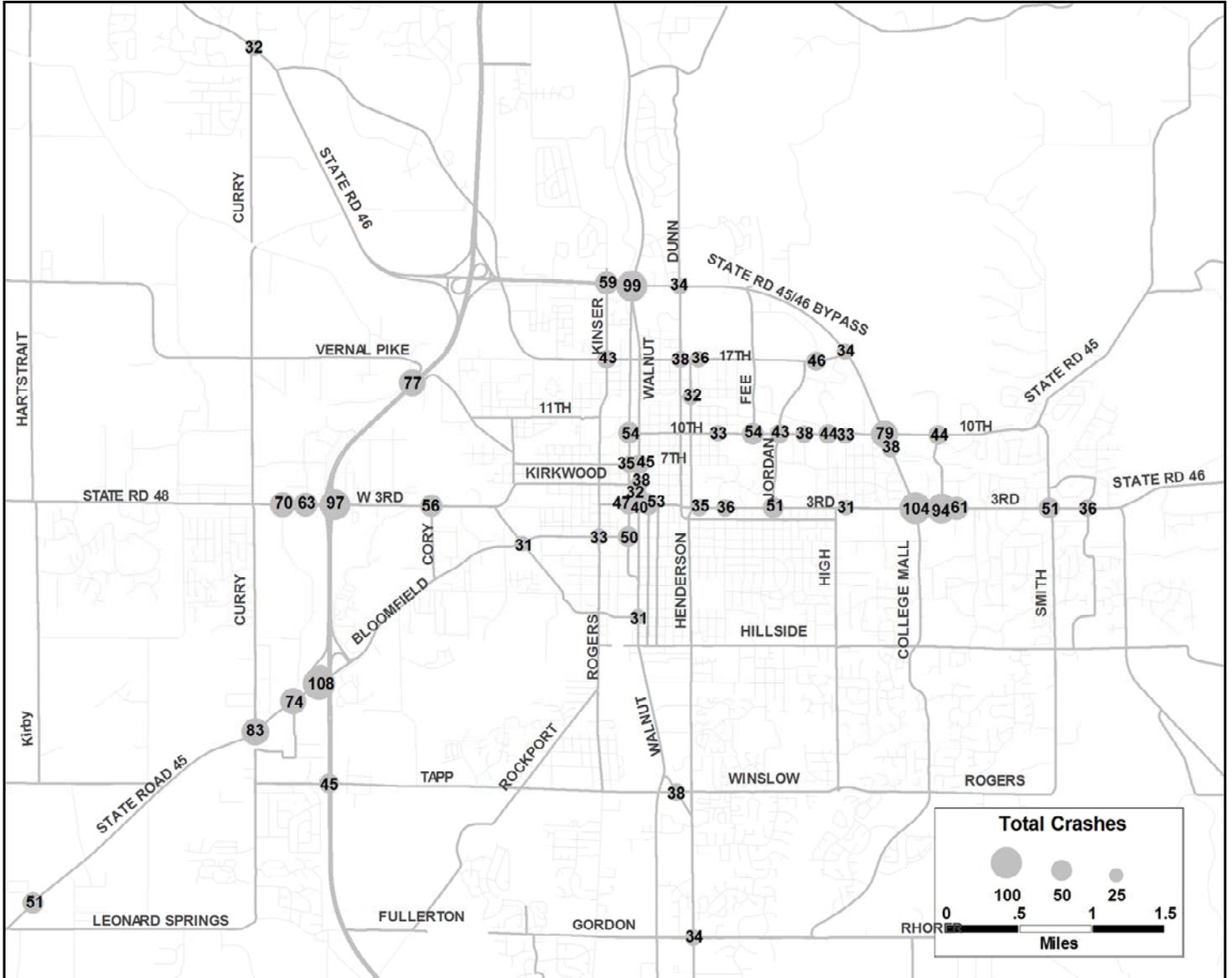
By identifying potentially problematic locations, this report has taken the first step to improving safety on our local roadways. It is expected that transportation planners, engineers, and local officials together will use this information to determine locations that need attention, and seek funding for necessary physical improvements or other means (enforcement, education) to improve safety.

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<sup>9</sup> At this location, 30 crashes occurred from 2007 to 2009, while 19 crashes occurred from 2009 to 2011.

# Appendix

**Figure A1. Top 50 Total Crash Locations, 2009-2011**



**Figure A2. Intersections with Three or More Bicycle and Pedestrian Crashes, 2009-2011**

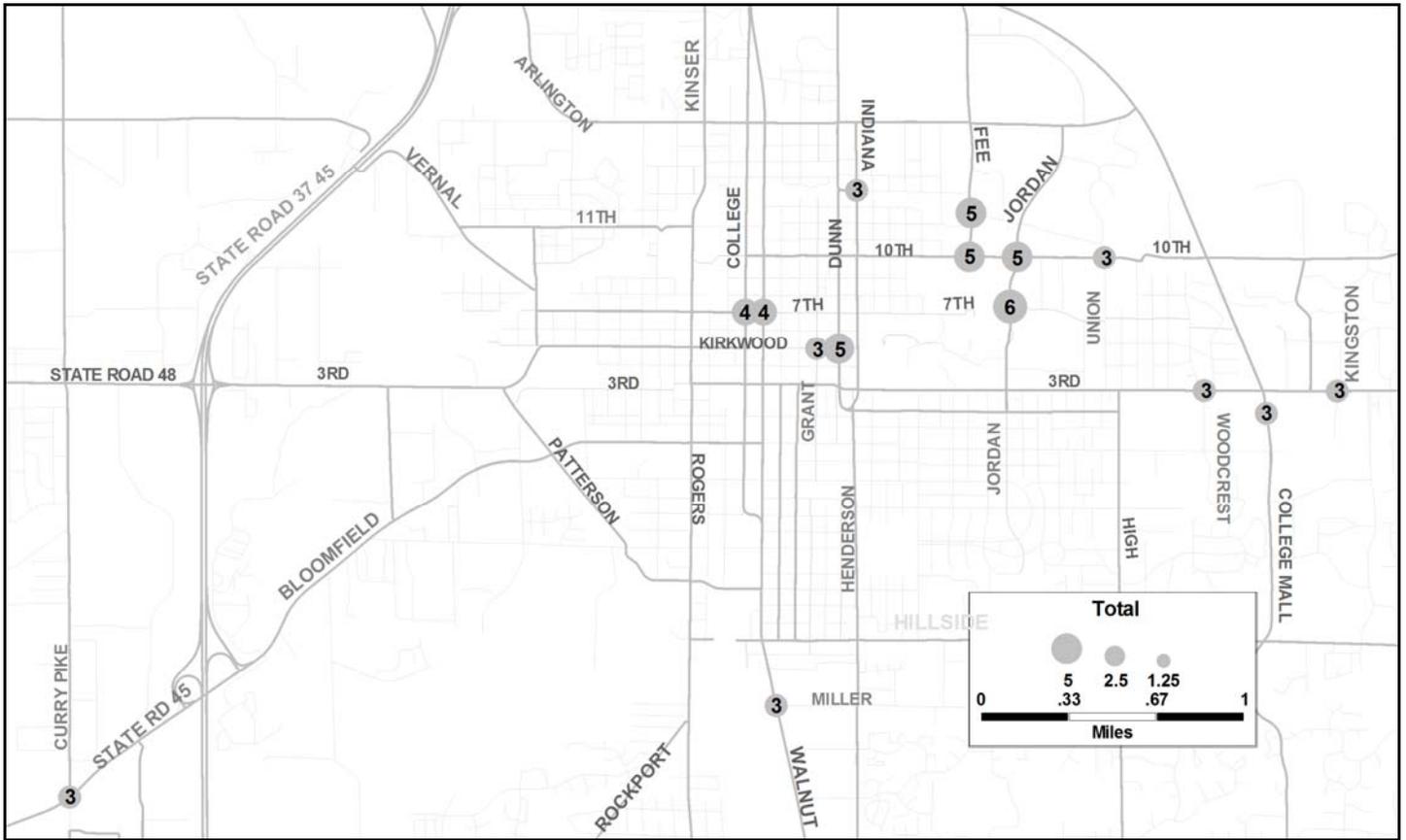
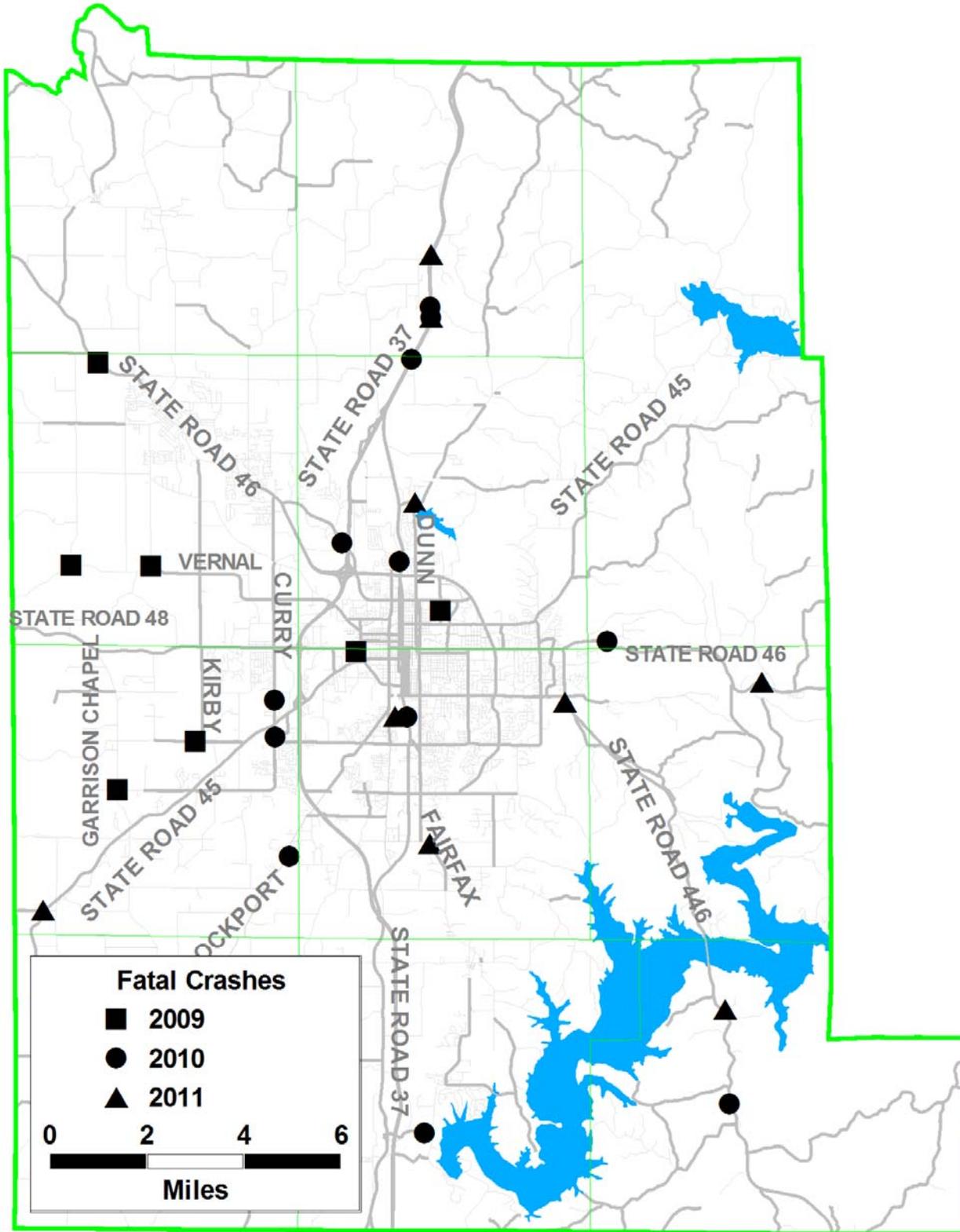
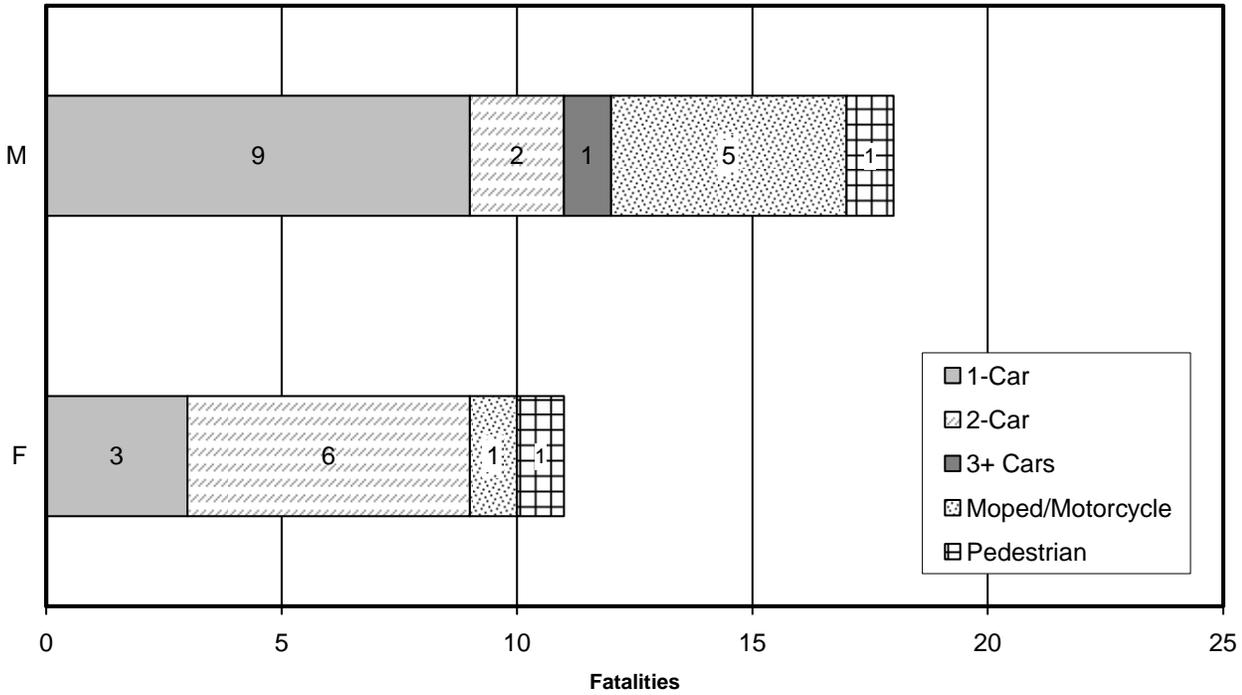


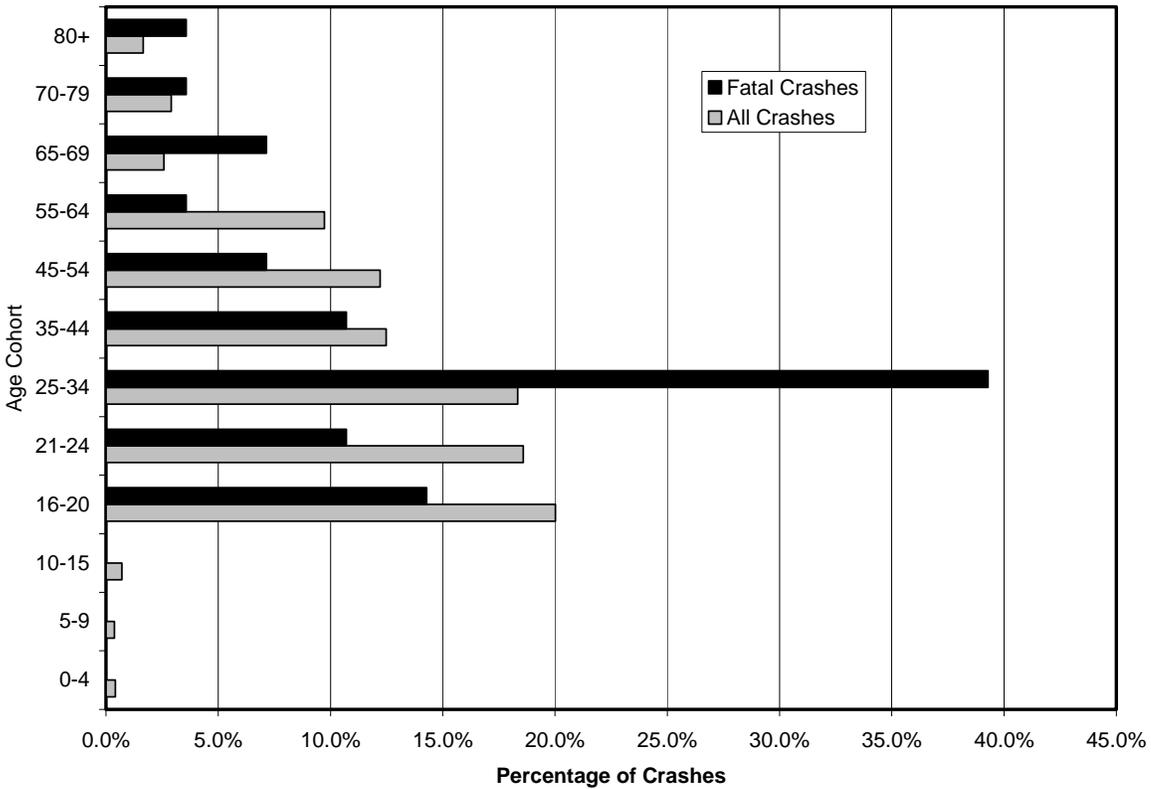
Figure A3. Fatal Crashes in Monroe County, 2009-2011



**Figure A4. Fatalities by Gender and Crash Type, 2009-2011**



**Figure A5. Portion of Individuals in All Crashes and Individuals Fatally Injured, by Age, 2009-2011<sup>10</sup>**



<sup>10</sup> For the purposes here, individuals whose age was not reported were excluded from the total number of individuals.

## **HSIP Eligibility List**

The Highway Safety Improvement Program (HSIP) is a program that provides federal funding for areas with a high incidence of crashes, as identified through the annual crash reports. Emphasis is paid to locations which have a high frequency of crashes resulting in fatal or incapacitating injuries. The intent of the funding is to leverage effective safety improvements in a timely fashion to reduce the severity and frequency of crashes.

Table A1 is the list of locations that are automatically eligible for HSIP funding. According to BMCMPO guidelines, there are three criteria that determine eligibility. In order to be eligible, a location must be: 1) within the Urban Area of the BMCMPO, 2) exclusive of INDOT facilities, and 3) rank in the top 50 locations when locations are ordered first by the frequency of crashes resulting in fatal or incapacitating injury, and then by the frequency of crashes of any type.

**Table A1. Eligible HSIP Locations, 2009–2011**

Current Rank	Previous Rank	Location	Jurisdiction	Fatal or Incapacitating Injury Crashes	Total Crashes	Fatal	Any Injury
1	8	E 3rd St & S Jordan Ave	COB	2	51	0	22%
2	15	N Dunn St & N Old State Road 37	COB	2	24	1	46%
3	2	W 3rd St & S Patterson Dr	COB	2	21	1	33%
4	1	W 2nd St & S Walker St	COB	2	9	0	67%
5	34	N Elm St & W Kirkwood Ave	COB	2	8	0	38%
5	33	S Fairfax Rd & E Schacht Rd	MC	2	8	1	63%
7	4	N Curry Pk & W Jonathan Dr	MC	2	6	0	67%
8	5	W 7th St & N Walnut St	COB	1	45	0	20%
9	10	W 17th St & N Kinser Pk/N Madison St	COB	1	43	0	33%
10	11	E 10th St & N Sunrise Dr	COB	1	38	0	18%
11	9	W 2nd St & S Rogers St	COB	1	33	0	30%
12	-	W Grimes Ln & S Walnut St	COB	1	31	0	39%
13	16	E 3rd St & S Swain Ave	COB	1	29	0	3%
14	-	N Smith Pk & W Woodyard Rd	MC	1	27	0	30%
14	-	E Miller Dr & S Walnut St	COB	1	27	0	26%
16	13	N Jordan Ave & E Law Ln	COB	1	25	0	8%
17	19	E 17th St & N Lincoln St	COB	1	24	0	25%
18	-	W 3rd St & S Kimble Dr	COB	1	23	0	48%
19	-	E Longview Ave & N Pete Ellis Dr	COB	1	20	0	25%
19	20	S Fairfax Rd & S Walnut Street Pk	MC	1	20	0	50%
21	-	N Curry Pk & W Vernal Pk	MC	1	18	0	22%
21	21	E 3rd St & S Ballantine Rd	COB	1	18	0	11%
23	17	E 13th St & N Fee Ln	COB	1	17	1	29%
24	18	W 15th St & N Walnut St	COB	1	16	0	31%
25	27	S Curry Pk & W Roll Ave	COB	1	15	0	33%
25	30	S Walnut St & S Walnut Street Pk	COB	1	15	0	7%
27	26	E 18th St & N Dunn St	COB	1	14	0	14%
27	29	N Grant St & E Kirkwood Ave	COB	1	14	0	29%
29	-	W 11th St & N Rogers St	COB	1	13	0	31%
30	-	E 4th St & S Grant St	COB	1	12	0	8%
30	21	W 3rd St & S Yancy Ln	COB	1	12	0	25%
30	27	S College Mall Rd & Eastland Plaza	COB	1	12	0	58%
30	3	S Curry Pk & W Gifford Rd	MC	1	12	0	50%
34	23	E 10th St & N Fess Ave	COB	1	11	0	18%
35	-	N Jacob Dr & W Whitehall Crossing Blvd	COB	1	10	0	20%
35	35	W Allen St & S Patterson Dr	COB	1	10	0	40%
35	-	E 1st St & S Fess Ave	COB	1	10	0	40%
38	23	W 15th St & N College Ave	COB	1	9	0	11%
38	35	W 11th St & N Morton St	COB	1	9	0	11%
38	-	E 8th St & N Washington St	COB	1	9	0	11%
41	42	E 11th St & N Indiana Ave	COB	1	7	0	29%
41	-	W Fullerton Pk & S Leonard Springs Rd	COB	1	7	0	14%
41	-	W Gordon Pk & S Rogers St	MC	1	7	0	14%
44	-	E 6th St & N Indiana Ave	COB	1	6	0	33%
44	37	W Fullerton Pk & S Rockport Rd	MC	1	6	0	17%
46	-	E Burks Dr & S Walnut Street Pk	COB	1	5	0	40%
46	-	N Curry Pk & W Grand Ave	MC	1	5	0	40%
46	-	E Atwater Ave & S Park Ave	COB	1	5	0	20%
46	-	W Howe St & S Rogers St	COB	1	5	0	40%
46	-	W Grimes Ln/W Patterson Dr & S Morton St	COB	1	5	0	60%
46	-	S Rogers St & W That Rd	MC	1	5	0	40%